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Three New Bats from Trinidad

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In a preliminary study of a collection of bats made by the Department of Agriculture of Trinidad and Tobago under the supervision of Arthur M. Greenhall, Curator of the Royal Victoria Institute Museum and zoologist for the Department of Agriculture, I find what appears to be new species of *Chiroderma*, *Cynomops*, and *Glossophaga*, which are described below.

During the past four years Greenhall has concentrated his efforts on the study of bats that carry rabies in Trinidad. His department processes some 3500 bats annually, which have included some new records for the island that will be published in a later report.

Acknowledgment is due to Miss Viola S. Schantz of the United States Fish and Wildlife Service for the loan of comparative material.

Chiroderma trinitatus, new species

TYPE: A.M.N.H. No. 175325, skin and skull, adult female, Cumaca, Trinidad, British West Indies, altitude about 1000 feet; collectors, L. Venus and B. Smith of the Trinidad Department of Agriculture; original no. 648; March 22, 1956. The type skin is preserved in spirits and has lost most of the fur; the skull is complete, with teeth showing considerable wear.

GENERAL CHARACTERS: Smallest species in the genus *Chiroderma*, forearm 40.5 mm. In cranial characters it is nearest to *Chiroderma doriae* Thomas but is readily distinguished from all described forms by its much smaller size and smaller teeth.

DESCRIPTION OF TYPE: Characters of the fur and color pattern indeterminate, but a large foetus found in the type shows a distinct white

line down the full length of the back from the back of the head; nose-leaf, ear, and tragus normal for the genus. Skull small, braincase smoothly rounded, with a very low sagittal crest; nasal bones absent, as is normal for the genus, their place occupied by an emargination extending back from nares to between orbits. Inner upper incisors slender, pointed, placed obliquely in tooth row, in contact or nearly so only at the tips and widely separated at base; outer upper incisors small, conical, scarcely reaching the cingula of canines and separated from inner incisors and canines by a distinct space. Canines both above and below relatively short and broad for the genus; anterior upper premolar more than half of the height of the posterior premolar and separated from it by a distinct space; lower incisors small, reaching the cingula of canines and filling the space between canines but not crowded; anterior lower premolar relatively large, with a distinct anterior cusp and separated from the posterior premolar by a comparatively wide space; posterior lower premolar relatively low and broad, the anterior cusp only slightly higher than anterior premolar; molariform teeth normal but small.

MEASUREMENTS OF TYPE: Head and body, 57.5 mm.; ear from meatus, 14.2; tragus, 5.5; hind foot, 12.5; tibia, 16.5; forearm, 40.5. Skull: greatest length, 22.5; condylobasal length, 20.4; zygomatic breadth, 13.7; postorbital constriction, 5.6; interorbital breadth, 5.7; mastoid breadth, 11.0; breadth of braincase, 9.6; breadth of palate across posterior molars, 10.3; greatest length of mandible, 15.0; maxillary tooth row, 7.7; mandibular tooth row, 8.4; length from front of posterior upper premolar to back of last molar, 5.1.

REMARKS: *Chiroderma trinitatus* can readily be distinguished from other forms in the genus by its small size, small teeth, and relatively large premolars.

There are now six named species of *Chiroderma* that can be recognized by the following characteristics.

Chiroderma salvini Dobson, Costa Rica: Size large, forearm 51; whitish facial and middorsal stripes usually moderately well developed. Skull large, canines and posterior premolars long and slender; inner upper incisors relatively short and broad, placed obliquely in tooth row and approaching each other terminally; anterior lower premolar nearly flat crowned and without distinct anterior cusp.

Chiroderma jesupi Allen, Colombia: Size small, forearm 41.5; dorsal and facial stripes absent; inner upper incisors long, slender, and perpendicular in tooth row; anterior lower premolar flat-crowned and without anterior cusp.

Chiroderma villosum Peters, Brazil: Size large, forearm 45–48; dorsal and facial stripes absent or inconspicuous; inner upper incisors long, slender, vertical, and not approaching each other terminally; first lower premolar nearly flat-crowned, without distinct anterior cusp (slightly developed in a specimen from Trinidad).

Chiroderma isthmicum Miller, Panama: Size large, forearm 45; slight white dorsal stripe present; skull of a female topotype similar to that of *villosum* but shorter and broader; inner upper incisors widely separated throughout their length, relatively small, slender, vertical in tooth row, and not approaching each other terminally; first lower premolar flat-crowned, without anterior cusp.

Chiroderma doriae Thomas, Minas Geraes: Size large, forearm 53; dorsal and facial stripes apparently absent; inner upper incisor relatively short, placed obliquely in tooth row, touching its fellow at its tip; anterior lower premolar with a distinct anterior cusp.

Chiroderma trinitatus Goodwin, Trinidad: Size very small, forearm 40.5; dorsal and facial stripes indeterminable; inner upper incisor short and placed obliquely in tooth row, approaching its fellow at tip; anterior lower premolar relatively large and with a strong, well-developed, anterior cusp that reaches to nearly half of the height of the canine.

***Cynomops greenhalli*, new species**

TYPE: A.M.N.H. No. 175326, skin and skull, adult male; Royal Botanic Gardens, Port of Spain, Trinidad, British West Indies; collector, Arthur M. Greenhall; June 6, 1955, original no. 300. The type

TABLE 1

MEASUREMENTS (IN MILLIMETERS) OF NAMED SPECIMENS OF *Chiroderma*

		Forearm	Greatest Length of Skull	Zygomatic Breadth	Maxillary Tooth Row
<i>salvini</i> ♀	Costa Rica	51.5	27.5	17.4	10.4
<i>jesupi</i> , type	Columbia	41.5	24.0	14.7	8.4
<i>villosum</i> ♂	Trinidad	48.0	26.2	16.0	9.2
<i>isthmicum</i> , type, ♀	Panama	45.0	24.6	15.6	8.8
Topotype, ♀	Panama	—	24.3	15.4	8.8
<i>doriae</i> , type	Minas Geraes, Brazil	53.0	—	—	12.6? ^a
<i>trinitatus</i> , type, ♀	Trinidad	40.5	22.5	13.7	7.7

^a Length of upper tooth row "0" .5" (Dobson).

skin is preserved in spirits and in good condition; the skull is complete. The type and a subadult female were taken in the hollow branch of a yellow Poui tree, *Tabebuia serratifolia*.

GENERAL CHARACTERS: A medium-sized, dark reddish brown, free-tailed bat with under parts of considerably lighter color than back; much larger than *Cynomops planirostris* but considerably smaller than *Cynomops cerastes*.

DESCRIPTION OF TYPE: Color of upper parts uniform Russet,¹ with the base of hairs white; the fur short, velvety, and glossy; under parts about dull Avellaneous. Nose, membranes, ears, feet, and tail blackish; a narrow strip of fur extends along outer side of forearm to base of metacarpals on upper side of membranes, and there is a patch of fur near elbow on the antebrachial membrane. Skull medium in size and less angular than that of *cerastes* or *planirostris*; rostrum relatively narrow and high; braincase relatively smooth and rounded, with a low but distinct sagittal crest extending from front of orbit to occipital crest; only two incisors in lower jaw (four lower incisors in a female topotype); first lower premolar smaller than second premolar (these teeth more nearly subequal in other forms of *Cynomops*).

MEASUREMENTS OF TYPE: Total length, 91.5 mm.; length of tail, 29.0; hind foot, 10; tibia, 11; ear from meatus, 13.8; tragus, 2.7; forearm, 36.8; third metacarpal, 37.6; fourth metacarpal, 34.7; fifth metacarpal, 20.5; first phalanx of third metacarpal, 17.3; second phalanx of third metacarpal, 17.6; first phalanx of fourth metacarpal, 14.4; first phalanx of fifth metacarpal, 9.5. Skull: greatest length (including incisors), 18.5; condylobasal length, 7.2; zygomatic breadth, 12.45; mastoid breadth, 11.9; interorbital breadth, 4.5; breadth of braincase, 8.6; breadth of rostrum, 7.9; breadth of palate across posterior molars, 8.2; maxillary tooth row, C-M³, 6.8.

REMARKS: The principal characteristics of *C. greenhalli* are size, high, rounded braincase, and narrow rostrum. The female topotype is considerably smaller than the type and not fully adult. It is about the size of *C. p. paranus* with which it seems to agree in color and measurements: under parts only slightly paler than back; forearm, 33.5; greatest length of skull, 17.0; zygomatic breadth, 11.0; maxillary tooth row, 6.4. However, except for smaller size the skin and skull have the major characters of *C. greenhalli*, especially the rounded braincase and high, narrow rostrum. The skull is quite distinct from that of *C.*

¹ Capitalized color terms are after Ridgway, "Color standards and color nomenclature," Washington, D. C., 1912.

planirostris. The skull figured by Miller (1907, Bull. U. S. Natl. Mus., no. 57, p. 248) as *Molossops planirostris* (U.S.N.M. No. 37741) is *M. cerastes* and is now identified as *cerastes* but originally had the name *planirostris* on the label.

TABLE 2

MEASUREMENTS (IN MILLIMETERS) OF NAMED FORMS OF *Cynomops*

		Forearm	Greatest Length of Skull	Zygo- matic Breadth	Maxillary Tooth Row
<i>mastivus</i> Thomas, type	British Guiana	49	23.8	16.5	8.8
<i>cerastes</i> Thomas	Peru	44-46	21	15.2	8.5
<i>malagai</i> Villa	Veracruz	49.1-50.9	20.8-21.0	12.9-13.3	8
<i>brachymeles</i> ^a Peters	Peru	42	—	—	—
<i>greenhalli</i> Goodwin, type	Trinidad	36.8	18.5	12.45	6.8
<i>aequatorianus</i> Cabrera, type	Ecuador	36	14.5	10	5.4
<i>planirostris</i> Peters	Paraguay	31.5-33.5	15.7-17.0	10-11	6-6.5
<i>p. paranus</i> Thomas, type	Para, Brazil	35	17.3	11.8	6.6
<i>temminckii</i> Burmeister	Paraguay	31-32	13.8-14.7	8.7-9	5.5-5.6
<i>t. griseiventer</i> Sanborn	Colombia	30.7-31.9	15.0-15.3	8.8-9.6	5.5-5.7
<i>t. sylvia</i> Thomas, type	Argentina	30	14	—	—
<i>milleri</i> Osgood, type	Peru	29	16	10.5	6
<i>matogrossensis</i> Vieria, type	Mato Grosso, Brazil	28	15	10	6

^a Mounted skin, cranial characters, and measurements not available.

***Glossophaga major*, new species**

TYPE: A.M.N.H. No. 176288, skin and skull, adult female, Ariapita Avenue, Woodbrook, Port of Spain, Trinidad, British West Indies; collector, M. Sookar; June 13, 1957. The type skin is in good condition, but the skull has been crushed.

GENERAL CHARACTERS: Largest species in the genus *Glossophaga*; similar in general characters to *Glossophaga elongata* Miller from Curaçao but much larger in size, and differing from *G. l. longirostris*

Miller from the mainland of South America in the narrower rostrum, longer and lower braincase, and larger size.

DESCRIPTION OF TYPE: General color of upper parts Prouts Brown, this color somewhat lightened by the paling tips of the hairs; the hairs Pale Pinkish Buff from base for most of their length; under parts Cinnamon Brown; flying membranes blackish brown; ears, noseleaf, and lips slightly darker than membranes. Skull long and narrow, with a narrow, slender rostrum and elongated braincase, the dorsal profile not forming an evident angle with rostrum in interorbital region; dentition about as in *elongata* but more crowded; posterior upper premolar relatively broad; posterior lower molar long and narrow, slightly shorter than in *elongata* but not so short as in *rostrata*; the postero-external projection of second upper molar narrow and drawn out.

MEASUREMENTS OF TYPE, TAKEN IN THE FLESH: Length of head and body, 61 mm.; hind foot, 11.5; forearm, 41.7; length of tail, 7; second metacarpal, 36.8; third metacarpal, 39.3; fourth metacarpal, 34.7; fifth metacarpal, 34; ear from meatus, 20; tibia, 17.3. Skull: greatest length, 23.5; breadth of rostrum over canines, 4; interorbital constriction, 4.7; maxillary tooth row, C-M³, 8.3; mandibular tooth row, C-M₃, 8.8.

REMARKS: The distinguishing characters of *Glossophaga major* are its large size and narrow, slender rostrum. The cranial characters, however, are not clearly defined owing to the crushed condition of the skull. The apparently long, narrow skull and low braincase suggest a closer relationship with *elongata* than *longirostris*, but its much larger size and dark color distinguish it from both species. The type is fully adult and was apparently nursing. The teeth show some wear but not an excessive amount.